

REMARKS

Reconsideration and allowance of the claims as amended are requested.

The above amendments positively recite the work-piece in the independent claims.

Antecedence for the amendments exists in the original application, claims and figures. No new matter has been added by this amendment.

The following reiterates the arguments of record as well as addresses the new rejections in the office action.

Claims 1-4, 6-9, 10-13, 17 and 18 are patentable under 35 U.S.C. 103(a) over Platt (U.S. Patent 1,666,347) in view of Rosa (U.S. Patent 6,113,472) and Heuze (U.S. Patent 1,864,823).

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 1 is distinguished from Rosa and Platt at least in that it teaches epicyclic movement of the grinding elements across an item that includes edges, roundings, and burrs. Platt discloses a continuous glass polishing apparatus where:

- there are a number of polishing members (9) each of which is provided with four polishing blocks (12),
- the polishing blocks are moved around in a guide (6) with a chain (14),

- the polishing blocks are rotated by means of sprocket wheels (23) on each polishing member and chain (22),
- chain (14) and chain (22) are driven by the same drive unit via drive shaft (20) and a gearing arrangement (14,15,17,21,24,25,26,27,28 – clearly shown in fig. 4).

This construction of the glass polishing apparatus gives the following disadvantages:

- It is not possible to control the speed of the polishing members (9) in relation to the rotary speed of the polishing blocks (12) which may result in non-uniform polishing of the workpieces (1).
- Along the guide bars 6 the rotary direction of polishing blocks (12) of the subsequent polishing members (9) will always be the same which means that it is not possible to efficiently deburr holes, edges and roundings.
- The structure of the gearing arrangement is technically complex and highly vulnerable to wear.

To achieve a satisfactory grinding and/or deburring of edges and roundings of a workpiece it is important that as many grinding operations as possible are performed, and that each grinding operation is in a direction opposite to the direction of the preceding grinding operation.

As Platt has polishing blocks (12) which all rotate in the same direction during the operation transversely across the workpiece (1), there will not be an efficient grinding/deburring of edges and roundings. If grinding of edges and roundings using Platt is to be performed, the polishing blocks (12) will lay down chips/burrs in one direction during the first operation transversely across the workpiece (1), and during the return operation, chips/burrs will be turned in the opposite direction. Most probably only a small proportion will be ground off the

chips/burrs whereby bits of projecting chips/burrs will be left on the edges and roundings of the workpiece.

When the last grinding operation has been effected, there will most likely be grinding marks left in the surface of the workpiece because all the last polishing blocks (12) of the return operation transversely across the item (1) are rotating in the same direction.

In order to achieve an optimum grinding of different workpieces it is important that the polishing members (9) and the rotary speed of the polishing blocks (12) can be adjusted independently of each other in relation to the conveying speed of the workpiece (1) to be ground/deburred. Thereby it is possible to achieve an optimum grinding/deburring of items (1) having different dimensions without having to adjust the mechanical gearing arrangement and/or to change the conveying speed of the workpieces (1). This is not possible with Platt.

It is difficult to ensure a satisfactory grinding/deburring of the edges/roundings in a hole/recess of a workpiece (1) if all the polishing blocks (12) are rotating in the same direction. Typically only one half of the edges/roundings in a hole/recess will be ground by a transversely directed grinding operation on a workpiece (1), whereas the other half of the edges/roundings in the hole/recess will ground by the return operation. This means that the edges/roundings in the hole/recess will only be ground once which is not enough in order to achieve a satisfactory grinding/deburring.

A more optimum grinding/deburring of the edges/roundings of the workpiece is achieved if each individual polishing block rotates around its own centre instead of having the four polishing blocks rotating around a common point of rotation. There is a higher risk that the four polishing blocks cannot grind uniformly across the entire surface of the workpiece when the joint rotation of the polishing blocks depends on the transverse movement of the polishing members.

Platt (Fig. 1) is furthermore shown as an apparatus where the polishing members extend beyond the support rollers and not along the edge of a glass plate (1). The table 2 is at a height such that the glass 1 to be polished is level with the top surface of the rollers 30 (Fig. 2). Therefore, as seen in Figure 2, the rollers will not contact the side edges of the glass and these side edges will not be sufficiently polished.

As it occurs from the above Platt discloses a technology which is suitable for polishing a flat surface. Platt does not give any teaching of grinding of an item that includes edges, roundings and burrs.

Accordingly, Platt discloses the possibility of a uniform polishing of surfaces without any possibility of deburring of edges and roundings which are part of such item being treated.

Even if the two references were combined, they would not read on the invention of Claim 1 in which there is a process of a plate formed item having burrs, roundings and edges. Rosa is an apparatus for polishing a roller. The polishing effect would not be able to perform the deburring effect which is an object of the present invention and moreover, the technology relating to treatment of rollers is quite different from the technology of treating sheet formed items that include edges, roundings and surfaces.

On the contrary the skilled person would have the opinion that the technology taught by Rosa would make it possible to obtain an efficient polishing effect in the line-formed area which extend parallel to the centre axis of the roller. This is quite contrary to the treatment of a sheet formed item and especially the treatment of a sheet formed item having roundings and edges which should be deburred during the grinding process. There is nowhere in Rosa where a skilled person could find teaching for treatment for a surface of an item that includes edges, roundings and surfaces, e.g. as found in table tops and sheet parts which are plain items.

The examiner states that Platt fails to disclose a grinding motor for each grinding head and thus relies on Rosa as teaching that subject matter. However, Rosa is non-analogous art and cannot render the present invention obvious because it is neither in the field of Applicant's endeavor, nor reasonably pertinent to the particular problem with which the applicant was concerned. Rosa should be removed as a reference.

Applicant's field of endeavor is the grinding of items being conveyed that have edges, roundings, and burrs. Rosa is in the field of removing chromium plating from a gravure roller and then polishing it. The technology relating to breaking and polishing of plated rollers is quite different from the technology of treating sheet-formed items that include edges, roundings and surfaces. Rosa is not in Applicant's field of endeavor.

Rosa is not reasonably pertinent to the particular problem faced by Applicant. The particular problem solved by the present application is the efficient and uniform cross-grinding of conveyed items with edges, roundings, and burrs with minimal consumption of sandpaper, and Rosa has nothing to do with that. Rosa does not, because of the matter with which it deals, logically commend itself to an inventor's attention in considering this problem. See Wang Laboratories Inc. v. Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993). Rosa has nothing to do with grinding of any kind. Rosa deals with the breaking and polishing of plated gravure rollers, in which uniform cross-grinding, edges and burrs, and sandpaper consumption are not a problem. No inventor would ever think to look to Rosa for solutions to problems with uniform cross-grinding of conveyed items with edges, roundings, and burrs. Therefore Rosa could not be analogous art.

Because Rosa is neither in the field of Applicant's endeavor, nor reasonably pertinent to the particular problem with which the applicant was concerned, it is non-analogous art and should be removed as a reference.

At least because Rosa should be removed as a reference and Platt does not teach or suggest each limitation of the claimed invention, the rejection of Claim 1 - 4 under 35 U.S.C. 103(a) over Platt in view of Rosa is improper and should be withdrawn.

Therefore the references, even in combination, do not teach or suggest epicyclic movement of the grinding elements across an item that includes edges, roundings, and burrs. The references thus do not teach or suggest each and every limitation of Claim 1.

The dependent claims share the elements of independent Claim 1 and add additional patentable features. For example, Claim 4 as amended adds that the grinding elements are connected to the grinding motors with a movable universal shaft or shaft with a ball/bowl joint, whereby items with non-uniform thickness may be ground on the top side face, since the grinding elements will follow the contour of the surface of the item. No reference teaches or suggests this limitation.

At least because Rosa and Platt, taken alone or in combination, do not teach or suggest every limitation of the claimed invention, the rejection of Claim 1 - 4 under 35 U.S.C. 103(a) over Platt in view of Rosa is improper and should be withdrawn.

MPEP §2141 states "the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co...* The factual inquiries enunciated by the Court are as follows:

- (A) Ascertaining the scope and content of the prior art; and
- (B) Ascertaining the differences between the claimed invention and the prior art; and

(C) Resolving the level of ordinary skill in the pertinent art."

It is respectfully submitted that the Office Action does not produce a *prima facie* case of obviousness at least in that it lacks a resolution of the level of ordinary skill in the pertinent art.

MPEP §2141.02 also states "Ascertaining the differences between the claimed invention and the prior art requires interpreting the claim language... and considering both the invention and the prior art as a whole." MPEP §2141.02 further states "In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious." (Emphasis in original)

It is respectfully submitted that the Office Action does not consider the prior art or references as a whole and does not consider the claimed invention as a whole, without the benefit of impermissible hindsight. Platt teaches a continuous glass polishing or grinding apparatus with a number of polishing members (9), each of which has four polishing blocks (12). Each group of polishing blocks rotates around a common point of rotation. The polishing members are moved around in a guide (6) and the polishing blocks are rotated by means of the same drive unit. Glass passes beneath the polishing blocks on a rolling table so that the glass is level with the top surface of adjacent rollers and supporting structure (Fig. 2, Page 1, ll. 40-50, Page 2, ll. 74-90). The polishing blocks pass over the top surface of the glass and adjacent rollers at a uniform height, all driven by the same drive means.

In contrast, Rosa teaches an apparatus for removing chromium plating from a roller with a metallic shell galvanically covered by a copper layer having a pattern and a protective chromium plating and polishing the roller. The method includes hitting the chromium plating with blunt bodies to break and remove the chromium plating by elastic collapsing of the

underlying copper layer. The copper is then smoothed and polished by rotating polishing members that move back and forth as the roller rotates. (Abstract, Figures) When a polishing member hits a spot with stronger resistance, ammeters detect the increased current draw and cause the member to be moved upwards from the surface (Col. 5, line 63 - Col. 6, line 43).

These are two completely different inventions that operate though different mechanisms. Platt teaches the use of a single drive motor and groups of grinding blocks rotating about a central point to polish the top surface of a sliding glass sheet, whereas Rosa teaches battering a roller with blunt objects, deforming the roller, and then smoothing and polishing the roller using polishing members with individual motors while the roller turns. The only similarity is that they both involve rotating heads. There would have been no motivation or suggestion to one of ordinary skill in the art to modify Platt with any of the teachings of Rosa.

It would not have been obvious to one of ordinary skill in the art at the time the invention was made to modify the single drive chain (22) which drives all the grinding heads simultaneously, of Platt, with grinding motors that individually drive each grinding head, in view of Rosa, in order to individually maintain constant pressure at different locations thereby removing the surface of the workpiece without causing undesired stress. No skilled person would know whether the technology of Rosa would make it possible to remove surface of a sheet formed workpiece without causing undesired stress. This allegation is not sustained in the disclosure of Rosa.

On the contrary the skilled person would have the opinion that the technology taught by Rosa would make it possible to obtain an efficient polishing effect on a roller in the line-formed area which extend parallel to the centre axis of the roller. This is quite contrary to the treatment of a sheet formed item and especially the treatment of a sheet formed item having roundings and

edges which should be deburred during the grinding process. Accordingly, there is no reason for the skilled person to make use of Rosa when the skilled person is faced with the problem underlying the present invention. The only possible motivation for such a combination is found in the present Application, the use of which is improper hindsight reconstruction.

MPEP §2141.02 teaches "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." (Emphasis in original) Platt is for the polishing of sheet glass. The addition of individual motors for each polishing block would have no apparent benefit while causing much greater complexity and expense. Since Applicant challenged the Examiner's suggestion that the chain 22 of Platt cannot be "modified" with grinding motors that individually drive each grinding head, the Examiner is relying on Heuze as teaching this feature.

However, as previously pointed out, if the grinding motors are to be added to Platt's polishing blocks and the chain 22 is to be removed, that would prevent the polishing blocks from rotating around a central point as taught by Platt and would also make the entire elaborate gear structure (Figs. 3 & 4) nonfunctional.

However, Heuze is also relates to polishing, like Platt and Rosa. Heuze is not a technology which is intended for processing an item having edges, roundings and burrs. There is a difference from polishing a plane surface as opposed to grinding an item having edges, roundings and burrs.

Heuze does teach one motor to actuate the polishers 4. Each of the polishers 4 is carried by trolleys 5 moving continuously in the direction of arrow Y guided by a monorail 6 (see column 2, lines 75-82). However, there is no showing as to how one of ordinary skill in the art would pick Heuze to fill the gap in Platt modified by Rosa without the benefit of hindsight

reconstruction using the present specification as a guide. Also, the combined teachings still do not arrive at the invention to grind an item which has roundings and edges and burrs.

It is well established, that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). See MPEP§ 2143.01(V). How the chain 22 of Platt would be "modified" with grinding motors is not disclosed anywhere and would not be obvious to one of ordinary skill in the art.

Thus when the references are considered as a whole, they do not suggest the desirability and thus the obviousness of making the combination. "[T]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification". In re Fritch, 23 USPQ2d 1783, 1784 (CAFC, August 1992).

The proposed modification of Platt with Rosa and Heuze will render the Platt apparatus inoperable for its intended purpose and therefore cannot be arrived at making the present invention non-obvious over the combined teachings of Platt and Rosa (see below).

Platt and Rosa and Heuze cannot be combined in the manner proposed by the Examiner. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Platt expressly teaches the polishing unit requires the described cross-head member 9 with vertical shaft 10 journaled in each carriage. Rotary head 11 is carried by each shaft 10 with plural polishing blocks 12 carried by each head for turning movements and rotary movements. Chain 14 is disposed over associated guide 4 and guided by sprocket wheels 15 mounted on

respective shafts 16 journaled in brackets 17 in standards 7. Shaft 16 carries a worm wheel 18 in mesh on a drive shaft 20 mounted on one side of the table runway in bearings 21 lengthwise of the frame.

Each guide 4 has four guide bars 6 to form upper and lower opposed bars. Each guide has two runs across the glass being polished. Guides 4 are supported by standards 7 and 8. Platt teaches a vertically adjustable scraping blade 33 at end loop and mandates that the polishing heads be rotated as they pass over the scraper 33.

Rosa has nothing to do with endless conveying. Rosa has fixed conveyors 175, 176. Rosa requires that the support 81 housing the guide 83, motor 82, and disk 4 be connected to the wheels 91 sliding on tracks 92 in central structure 50 for supporting each operating head 1 and driving each when the chain 53 is driven. Rosa provides guide 83 to vertically shift motor 82 along axis 84 of support 81 when the oscillation assembly 8 acts thereon.

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Rosa is of less importance, seeing that it is an apparatus and method for polishing a roller and removing the plating from such roller. This is quite different from the grinding of a surface which is substantially plane, however having edges, roundings and burrs. Moreover, the technology disclosed by Rosa does not involve an endless conveying means for the grinding head. Seeing that this new technology discloses one row of elements for polishing a roller it is difficult to see that a skilled person should take this element from the technology of polishing a roller surface and make use of it in a substantially plane surface, and furthermore to combine this 2000 teaching with a teaching being 70 years older. Even when combining it is difficult to

understand why the skilled should take the teaching of the new technology of Rosa and replace with the old technology disclosed by Platt or Heuze.

Given the express teachings of Rosa, it is apparent that the Platt polishing heads being subjected to the vertically moving scraping blade 33 will be harmed with the vertically movable Rosa disk 4 that has to be in a fixed loop. Thus, the combination of Rosa and Platt will do harm to the Platt device and would require major modification of the entire Platt apparatus as taught by that reference. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Understandably, the Examiner uses hindsight reconstruction to justify an obviousness holding. However, that is against the norms set by the Courts for any 35 U.S.C. 103 inquiry. "It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." *In re Fritch*, 23 USPQ2d 1783, 1784 (Fed. Cir. 1992), quoting from *In re Gorman*, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). "This court has previously stated that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." *Id.* quoting from *In re Fine*, 5 USPQ2d 1600 (Fed. Cir. 1988).

Thus, Rosa cannot be combined with Platt. Claims 1-20 are patentable under 35 U.S.C. 103(a).

At least because none of the references teaches or suggests each and every element of the claims, because there is no motivation to combine the references in the manner suggested by the Examiner, and because Rosa is non-analogous and should be removed as a reference, the

rejection of the claims 1-4, 6-9, 10-13, 17, and 18 under 35 U.S.C. 103(a) is improper and should be withdrawn.

Claims 5, 14, and 19 are patentable under 35 U.S.C. 103(a) over Platt (U.S. Patent 1,666,347) in view of Rosa (U.S. Patent 6,113,472), Heuze (U.S. Patent 1,864,823) and Knost (U.S. Patent 2,985,989) and Price et al. (U.S. Patent 2,901,868).

Claim 5 as amended depends from and shares the patentable limitations of Claim 1 and adds that first and second rows of the grinding elements are arranged to move in directions perpendicular to the direction of motion of an object on the underlying conveyor, one or more grinding elements rotate in a different direction than one or more other grinding elements, and the second row of grinding elements rotate in a direction opposite to the first row of grinding elements. No references, taken alone or in combination, teach or suggest this limitation. Likewise, claims 14 and 19 adds patentable limitations to claims 6a dn 17, respectively.

In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983).

Knost is also an old technology and a combination of Knost with the technology of Platt is not within a normal combination for a skilled person. Knost only discloses one row of grinding elements 26, 27, 28 and 29. All are supported in a box frame 30. Therefore there is no conveyor and the skilled person having a starting point from Platt from 1928 is believed to take advantages of newer technology disclosed by Knost in the 1961-document. Therefore if a skilled

person would combine the two documents it is believed that the skilled person would make use of the structure disclosed in Knost.

Moreover, Knost is arranged to establish a finishing of a surface in order to establish a slab thickness which is uniform in relation to the underside of slab. Reference of this technical effect is found in column 1, lines 42-54. Even if Knost may have grinding heads rotating in different directions (occurs from fig. 3), yet, Knost has only one row of these elements and does not disclose an endless conveying means with an annular course and does not disclose an epicyclic movement of the grinding elements.

The technology disclosed by Price is almost of the same age, namely from 1959. It is non-analogous art, as it relates to an apparatus for cleaning brick from water. The bricks 55 are guided between the interspace between the two cutters and thereby water is removed from the opposed surfaces of the brick 55. There is no disclosure of an endless conveying means for the grinding heads and there is no annular course for the movement of the grinding heads.

Moreover, Price does not teach the use of a grinding motor for each grinding element.

Given that Platt and Rosa and Heuze do not describe, teach or suggest the claimed invention, claims 5, 14, and 19 which depend from patentable claims 1, 6, and 17 respectively, cannot be rendered obvious over Knost or Price combined with Platt and Rosa. Claims 5, 14, and 19 are not obvious in view of the references and should be allowed.

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CONCLUSION

Reconsideration and allowance are respectfully requested.

Respectfully,



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